Neutrino Beam
of Expected Events

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Short report
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Outline

- Introduction
- Event Samples
- Plots
- Conclusions
- Outlook

Introduction

- The neutrino production in the proton beam target has been analyzed (Aug 99)
- The veto wall efficiency problem has been solved (today)
- Monte Carlo efficiencies for trigger, stripping, and visual scanning have been computed (Dec 99)

→ We are ready for the absolute neutrino flux normalization

  - expected number of (tau) neutrino events
  - number of nonprompt neutrinos

- see also Byron's talk on the same subject

Event samples

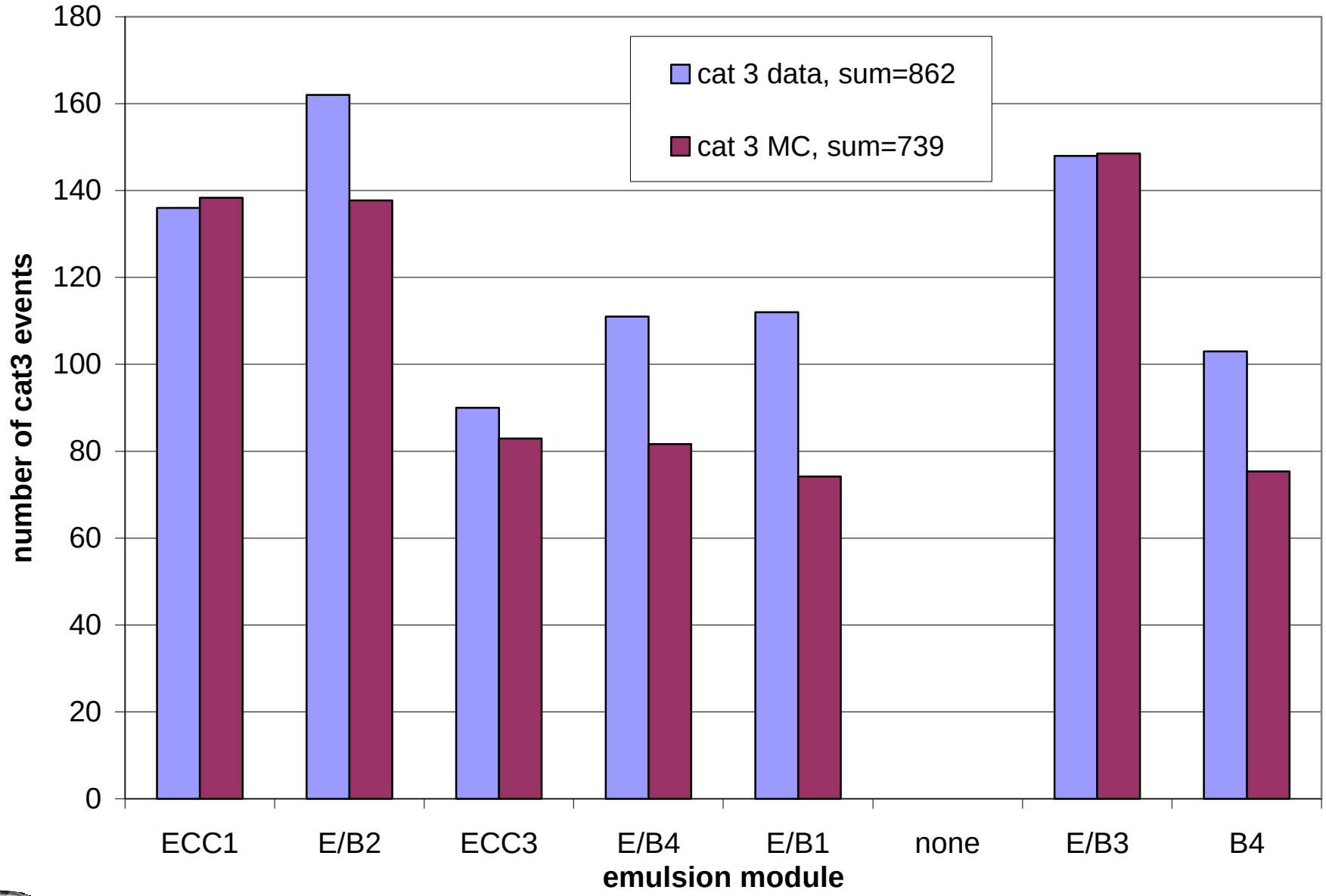
- Category three events
- Events containing an identified muon
  - software selected from nustrip files
- Events with >5GeV measured in the EMCAL
  - software selected from nustrip files
  - only period 4
  - about half are ν_eCC events
- Events with >20GeV measured in the EMCAL
  - software selected from nustrip files
  - only period 4
  - about 2/3 are ν_eCC events

Plots

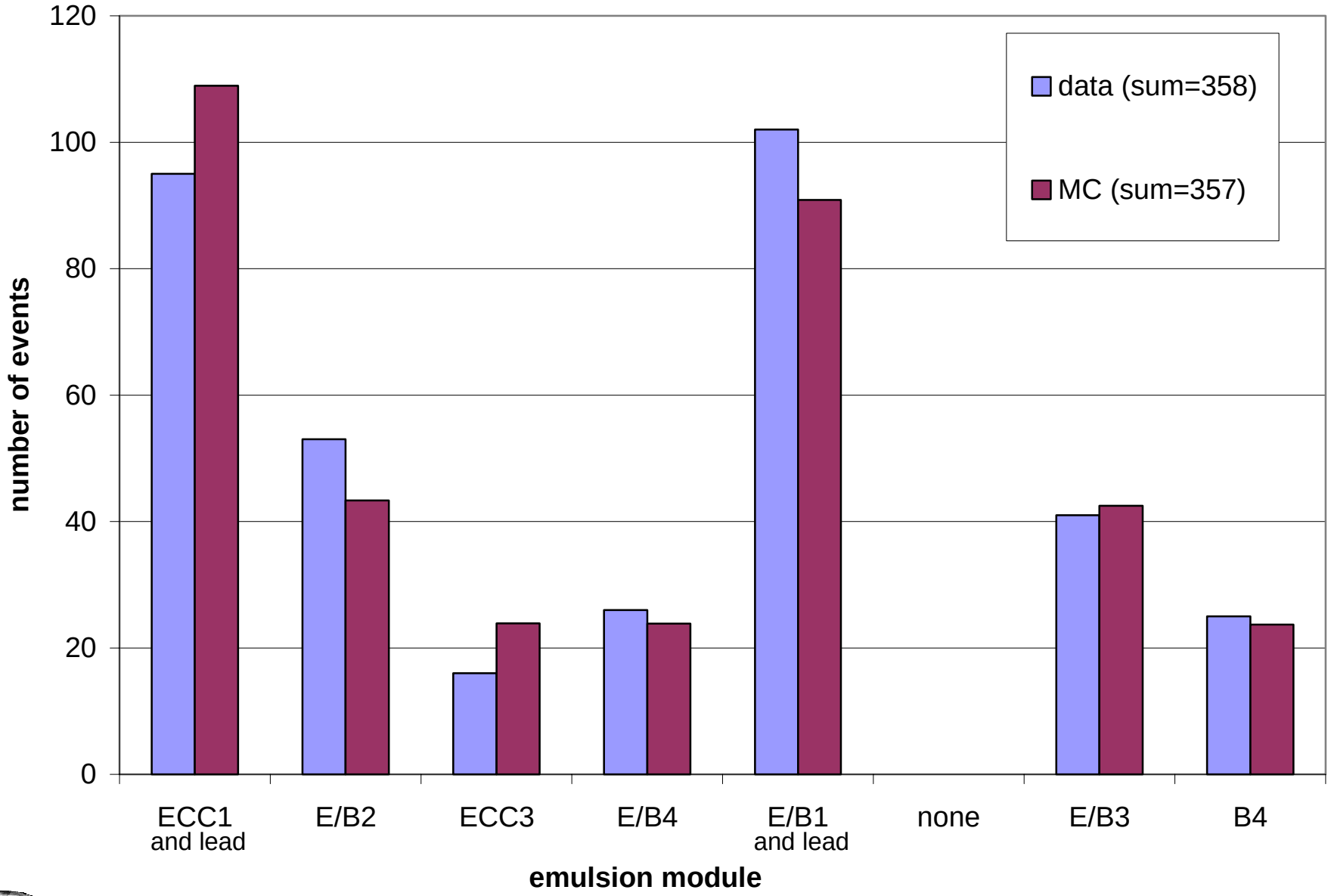
- Include all efficiencies
- use calculated neutrino flux
- nonprompt ν's: 1.6×10^{-18} interactions/kg/POT
  - 40% of the prompt flux

- # of expected vs. # of selected events with a muon, by module type
  - category 3
  - muon events
  - neutrino interactions in period 4 after EMCAL energy cut

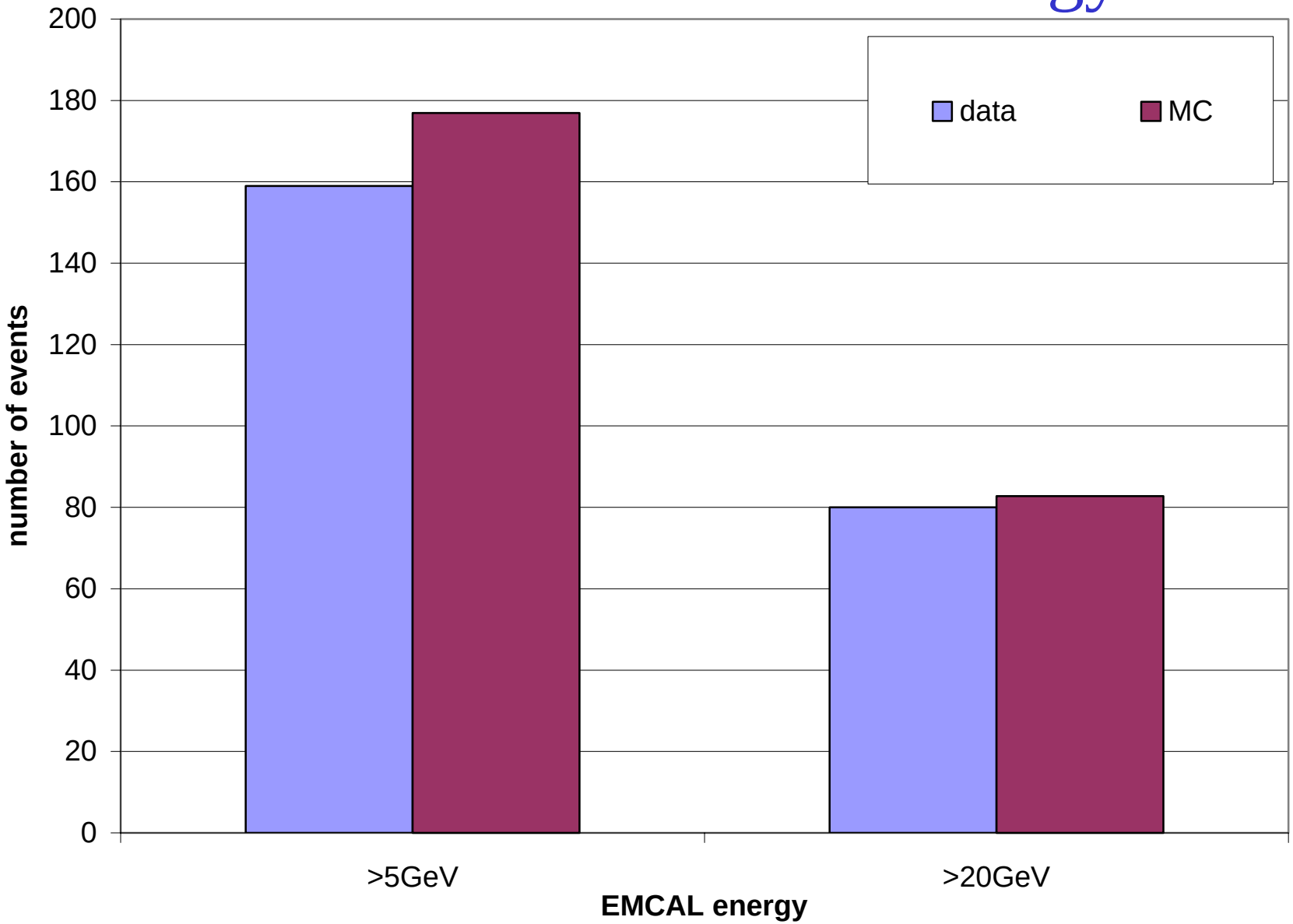
Category 3 events



Muon Events


120
100
80
60
40
20
0
number of events
data (sum=358)
MC (sum=357)
ECC1 and lead
E/B2
ECC3
E/B4
E/B1 and lead
none
E/B3
B4
emulsion module

of events after EMCAL energy cut



Conclusions

- The expected number of events agrees with the predicted number of events
  - within 10% for all event samples
  - maybe a selection efficiency problem for cat 3
  - agrees with Byron's results
- The contribution from nonprompt neutrinos is small
  - 40% of the prompt neutrino interactions
- We expect 33.8 ν_τ CC category 3 events
  - in the emulsion modules
  - 45.9 events before efficiencies.

Outlook

- Somebody should do an independent analysis of the visual selection efficiency
- Find an additional method to test the nonprompt neutrino flux
- I will shift my focus to my thesis topic